An Economic View of Parking Structures as Land Uses

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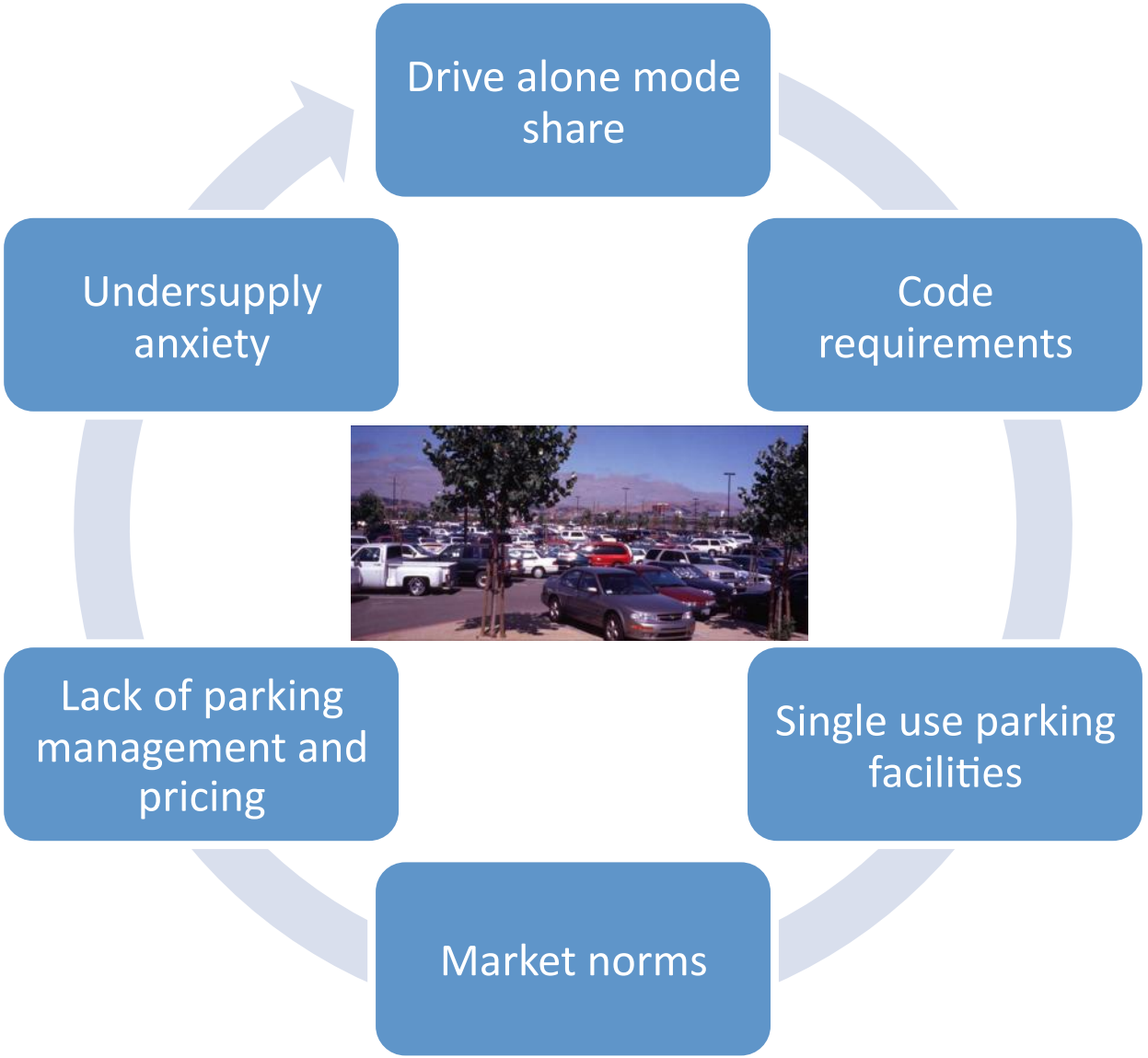
Parking economics is weird economics

Minimum parking requirements	• Codes distort market-based evaluation of parking supply • Parking is not a separate economic decision • Plentiful supply frequently ensures that no market price can be established
Parking costs are hidden	• Capital cost of parking may not be separately analyzed in pro forma • Operating costs of parking may be blended • Lease structures hide costs, which are embedded in rents, prices, lower land values, etc.
Indirect effects on land uses	• Density and associated land value • Project cost and affordability • Adapting to tight sites
Parker behavior	• Space search behavior • Space preferences • Alternative perceptions of costs

Why parking economics are distorted….




Haven Ave
Utica Ave
Cleveland Ave
Milliken Ave
Pittsburgh Ave
Buffalo Ave
Mission Park Dr
E 4th St
Via Asti
Via Piemonte
Concours St
Ontario Center
Ontario Mills Dr
Rochester Rd
Porsche Way
Mercedes Ln
Ferrari Ln
Mall Dr
N Milliken Ave
Mills Cir
Inland Empire Blvd
N Haven Ave
Mojave Fwy
San Bernardino Fwy
10
15
Ebony St
N Ponderosa Ave
Sequoia Ave
© 2010 Google
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Imagery Date: Nov 16, 2009
34°04'16.34" N 117°33'35.20" W
elev 0 m
Eye alt 2.75 km

Benefits of parking structures

Land use efficiency	• Surface spaces ~ 350 sf per space • Parking deck ~ 175 sf per spaces • 4 story structure ~ 87 sf per space
Shared parking	• Reduce walking distance from parking to destination • Strategic locations for sharing • Scale justifies active parking management
Design integration	• Ground floor retail and wraps; façade treatments • Use of roofs for energy production, sides for urban agriculture • Less runoff, urban heat island effects than surface parking
Enabling density	• Structures allow higher project density, increasing ROI • Preserve land for open space, bio swales, etc.

Problems with parking structures…

Cost	• $12,000 – $41,000 + per space, rising as enhancements added • *Net* space added metric • Operating costs
Monolithic land use	• Bulky single use structures (usually) • More land area used per access even than other modes • Impacts on streetscape, pedestrian and bicycle safety
Modal bias	• Prioritizes vehicle access over other kinds of access • Expense of structures may exhaust access resources • Fewer equirements for other access modes
Use efficiency	• The “empty top deck” syndrome • Complex space search

Cost issues

Capital	• Land • Structure • Impact of layout on efficiency
Operating	• Utilities • Maintenance • Labor
Opportunity cost of land use foregone	• Tax revenues from other land uses • Local employment foregone • Synergistic effects

Wilbur Smith/MTC capital cost analysis

Parking type	Spaces	Construction cost per space	Construction cost per space w/ land @ $500,000	Construction cost per space w/ land @ $2,500,000
Surface	125	$7,000	$9,000	$25,000
Deck	250	$13,000	$14,000	$22,000
4 levels above ground	500	$24,400	$24,900	$28,900
3 levels underground	375	$38,500	$39,883	$45,167

Wilbur Smith conclusions

When are structures justified by land costs?	• Single level decks @ $2 million per acre • Structures @ $5 million per acre • Underground @ $10 million per acre
What are the net annualized costs per year?	• $205 - $1,934 @ $500,000 per acre • $858 - $2,262 @ $2.5 million per acre
Transportation opportunity costs	• Transit enhancements • Bicycle improvements and programs • Pedestrian improvements and programs

Alternative pricing notions

Operating costs	• Where market price is zero • Good first step, easy to explain • Fairness to non drivers
Annualized capital cost + operating cost	• Where site costs are not born by parking developer • Magnitude surprising to many stakeholders
Annualized capital cost (w/ land cost) + operating cost	• The price if a parking structure was to “pencil” on its own
Market price	• Driven by supply and demand conditions • Distorted by minimum requirements, which artificially inflate supply, zero in many suburban locations

Case study: parking versus TOD in BART system

1:1 replacement of surface parking when TOD developed	• Few projects penciled out • Low ground lease revenue to BART
Conceptual blocks	• Developer “owes” parking rather than access • No tool to assess replacement parking
Analytic tool	• Revenues – fares, parking, ground rent • Costs – parking, train, other access • Other goals – context, other BART goals


A

MacArthur case study

Willson, R. and V. Menotti (2007) "Commuter Parking Versus Transit-Oriented Development: Evaluation Methodology." (2007) *Transportation Research Record: Journal of the Transportation Research Board, No. 2021.* (pp. 118-125)

Context

- 0.1 spaces per rider
- 51% non-auto access
- 9,500 people w/in ½ mile; 5,600 jobs
- Parking free and 100% occupied

Scenarios

- Medium density TOD, status quo parking
- Medium density TOD, 50% replacement, $1 per day (half of spaces)
- Higher density TOD, 50% replacement, $3 per day charge (all spaces), bus access improvements

Evaluation of MacArthur Alternatives

Scenario	Medium density TOD, status quo parking	Same TOD, 50% replacement, $1/day for ½ spaces	Higher density, 50% replacement, $3/ day, + bus access
Net boardings (daily)	+962	+638	+1,411
Net revenues (annual)	$495,910	$763,000	$1,316,791
Net costs (annual)	$111,301	-$50,522	$229,478

Many places have enough parking for the next 25 years, *right now*

"We will build no parking before its time"

- Parking construction as the exception rather than the norm

Parking *structures* when:

shared, priced, and support densification, economic development, and good design

Compare parking structure costs with market for other access modes and their cost…


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